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Conducting Best Management Practices and implementing Pollution Prevention (P2) technologies can reduce operating costs and improve the working environment.

Use the following checklist to review your operating practices and to identify technologies that prevent pollution.

Pollution Prevention

Equipment

Mechanical Wipers on Mix Tanks
In order to reduce the amount of paint left clinging to the walls of a mix tank, rubber wipers are used to scrape the sides of the tank. This operation requires manual labor and hence the percentage of waste reduction is a function of the operator. Since the benefits will be offset by increased labor, mechanization/automation should be considered. Many new mixers are available that are designed with automatic wall scrapers.

Installation of Teflon Liners on Mix Tanks
Installing Teflon lined tanks will reduce paint adhesions and improve drainage. The reduced amount of adhered waste will make dry cleaning (no solvent or water use) more desirable. This method, however, is more applicable to small batch tanks that are practical to clean manually.

Countercurrent Rinse Methods
Countercurrent rinsing is the process of matching a rinse solution to the rinse job, based on the initial level of contamination in the solution. This means, using "dirty" (but not spent) solvent for first rinse, followed by a slightly cleaner solution for the second rinse, ending with a final rinse of clean or virgin solvent. This method has proved to significantly reduce the volume of solvent or water needed for cleaning, and is particularly effective through at least three stages.

High Pressure Wash Systems
After scraping the tank walls, high pressure spray hoses can be used in place of regular hosed to clean water-based paint tanks. High pressure wash systems have shown the ability to reduce water use by 80 to 90 percent. In addition, high pressure sprays can remove partially dried-on paint so that the need for caustic is reduced.

Automation

Vapor Recovery System

Design Process tanks with a 1:1 Diameter to Height Ratio

Process Materials

Biochemical Substitutes
Volatile components, which typically consist of hydrocarbon solvents, account for 40-65 percent of the paint or coating formulation. They are necessary to lower the viscosity of the nonvolatile components, enabling the coating to be applied to a surface. It is this volatile component of the formulation that contributes to VOC emissions.

Some biochemical substitutes can act as both a solvent and a resin, thus eliminating the need to add volatile hydrocarbon solvents. These biochemical additives are called "reactive diluents" and can be derived from either linseed or tung oil. These diluents work by reducing the viscosity of the coating, like a solvent. But instead of evaporating out of the coating, the diluent dries and becomes part of the paint film itself. Since it cures directly into the coating, it does not contribute to VOC emissions. The economics of using diluents are favorable because the cost of the additive is offset by the reduction in both solvent and resin components needed in the formulation.

Use Paste Pigments
Pigments in paste form are dry pigments that have been wetted or mixed with resins. Since these pigments are wet, less dust or no dust is generated when the package is opened. In addition, most pigments in paste form are supplied in drums and therefore would eliminate the waste due to empty bags. While this method would increase the amount of pigment handling occurring at the supplier's facility, it can be argued that the overall number of handling/transfer points for dry powder would be greatly reduced along with the probability of spills and dust generation.

Use Pre-Dispersed Pigments

De-emulsify Spent Rinses

Re-use Baghouse Dust
There have been several paint and coating manufacturers throughout the nation who are successfully reincorporating baghouse dust into product, thus preventing it from becoming waste.

Pre-determine Re-work Potential
A practice that several manufacturers are doing is having laboratory and management determine re-work potential of experimental products before they authorize the experiment. This practice prevents the product from becoming a potential hazardous/dangerous waste should the product fail to meet performance/quality standards.

Best Management Practices

Reworking Off-Spec Materials
Reworking or blending of off-spec materials into new products is an on-going effort by many facilities. This practice is driven more by economics than environmental issues. Some facilities are even reworking solvent-based products into water-based products. This can greatly reduce the use of hazardous chemicals.

Eliminating Heavy Metals and Chlorinated Compounds
Chromium, lead, mercury-based bactericide, and methylene chloride can virtually be eliminated.

Inventory Management
Centralize responsibility for storing and distributing solvents and other raw materials.

- Check materials for damage and expiration date upon receipt.
- Use materials tracking software.
- Follow the storage instructions of all materials to prevent spoilage.
- Hard plumb solvent distribution systems.
- Keep waste chemistries segregated to allow for reuse and recycling.
- Offer mis-tints to non-profit organizations, schools, low income developments, community projects and organizations often seek out materials donations such as paint from businesses in the community.

Using Re-usable and Recyclable Containers
Actively pursue using recyclable containers for raw materials and finished product to reduce the generation of solid waste.

Enhance Communication Between Formulator and Production Worker
When manufacturing a new product for the first time, the formulator should work with the paint maker to limit the production of off-specification product.

Clearly Indicate/Highlight Formula Changes on Work Orders
Prevent producing off-spec products due to human error by clearly highlighting formulation changes on work orders.

Use Re-usable Bag, Metal, or Vortisieve Screens and Filters
Solid waste can be reduced in the paint filtering process by using re-usable filters rather than common disposable filters.

Use of Sandmills
Instead of ball mills, sandmills should be used for grinding and mixing raw ingredients. Sandmills are more efficient and they require less solvent for cleaning. Also, by dedicating mills to specific colors or color-ranges, less cleaning is required.

Schedule Light to Dark Colored Products
This is a good technique to minimize the amount of cleaning needed between batches or similar formulations: milling is scheduled to start with light colors and progress toward dark colors.

Dedicate Equipment to a Product
To reduce the need for cleaning and the generation of wash solvent or wash water, equipment could be dedicated to

a particular product or family of products.

Re-work Wash Solvent and Wash Waters
Wash solvent and wash water should be worked into future product formulations rather than being disposed.

Manually Clean Tanks
Clean tanks manually with a wiper or "squeegie" rather than with solvents.

Solvent Distillation
Distill solvents from paint products and rework into new batches of product.

Maximize Batch Size
To reduce clean-out waste from many small batches, batch size should be maximized.

Use Shower Caps and/or Tank Covers
Install "Shower Cap" or other tank covers on in-process tanks or tanks of final product waiting to be packaged. Tank covers reduce the amount of volatile emissions from evaporation.

Employee Incentives
Challenge your employees to come up with waste reduction opportunities. Shop employees have a unique perspective on what is generating wastes and stimulating the thought process with a reward system could achieve positive waste reductions.

Rotate Laboratory and Manufacturing Personnel
Rotating laboratory personnel into manufacturing positions, or vice versa, is a low-cost practice that has positive effect on communications between the two groups which often leads to reduced batch-making errors and inconsistencies.

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